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The Economics of Public Nuisance Law and the New Enforcement Actions

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Abstract: In contrast to the traditional legal commentary, I find nuisance law to be a coherent body of rules that serves an explainable function. Nuisance optimally regulates activity levels. Nuisance law induces actors to choose socially optimal activity levels by imposing liability when externalized costs are far in excess of externalized benefits or far in excess of background external costs. The new enforcement actions for lead paint abatement or gun control purposes have an arguable theoretical basis in nuisance law. However, as currently framed, the lawsuits are inconsistent with significant parts of the doctrine and the theory.

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I. Introduction

Tort law distinguishes between private and public nuisances. A private nuisance is an intentional and unreasonable interference with the quiet use and enjoyment of property. A public nuisance is an intentional and unreasonable interference with rights that are common to the public.

Commentators have described nuisance law as an impenetrable jungle, and have suggested that private and public nuisance law be given different labels to avoid the tendency to view them as equivalent legal doctrines.¹ The theoretical underpinnings of private nuisance law are difficult enough to explain, and there has been little effort in the literature to explore them in depth. In comparison, public nuisance law remains an unexplored area from the perspective of theorists. The case law on public nuisance that is taught in law schools is scant, and what is provided is almost totally void of any theoretical justification beyond the circular pronouncements of the courts.

Over this background comes a new set of challenges for public nuisance doctrine. State attorneys general have latched on to public nuisance doctrine as a handy tool for public interest litigation. Public nuisance lawsuits have been brought against gun manufacturers for gun-related murders in cities, and more recently against paint manufacturers for the costs of removing lead paint from homes.

The purpose of this paper is to look closely at the theoretical underpinnings of public nuisance doctrine. I will examine its relationship to private nuisance doctrine, and use the theoretical framework developed here to set out an account of the doctrine's scope, and its relevance to modern public interest litigation.

In contrast to the traditional legal commentary, I find nuisance law a coherent body of rules that serves an explainable function. Nuisance optimally regulates activity levels. Nuisance law induces actors to choose socially optimal activity levels by imposing liability when externalized costs are far in excess of externalized benefits or far in excess of background external costs. This theory explains nuisance doctrine.

The new enforcement actions for lead paint abatement or gun control purposes have an arguable theoretical basis in nuisance law. However, as currently framed, the lawsuits are inconsistent with significant parts of the doctrine and the theory.

II. Descriptive and Intuitive Legal Distinctions

Public nuisance cases involve interferences with rights common to the public, while private nuisance cases involve interferences with rights of property owners. In this part I will explore the relationship between public and private nuisance, employing intuitive

¹ WILLIAM L. PROSSER, *HANDBOOK OF THE LAW OF TORTS* 571 (1971). In spite of Prosser's description of nuisance law as a jungle, he did an admirable job of clearing some paths through it.

arguments. In the following parts of this paper I will set out an economic framework for nuisance doctrine which includes public nuisance doctrine as a part.

Rights protected by private nuisance are easy to explain: they are the rights landowners anticipate having protected as part of ownership of property. Property owners expect to have the right to enjoy their property, within limits. This implies some minimal ability to remain on the property, and not be driven off, or find it intolerable, because of noise, bad smells, harsh lights, pollution, or other invasions.

The common law has traditionally distinguished private nuisance from trespass on the ground that trespass involves an invasion of the right to exclusive possession, while nuisance involves an invasion of the right to quiet use and enjoyment of property. Thus, a trespass claim involves a physical displacement from some portion of a property; as when a large object invades the property. A nuisance claim, on the other hand, involves no physical displacement or occupation of space; it is enough that the property owner (or possessor) cannot exist on his property without suffering an invasive interference that substantially diminishes his valuation of the property.

Public nuisance is said to protect rights common to the public rather than rights of property owners. Rights common to the public are likely to be somewhat more circumscribed than those of property owners. Still, the list of rights protected by public nuisance is substantial. Public nuisance law has protected rights to safety, to health, to reasonable comfort and convenience, and even to freedom from moral effrontery.² Of course, the rights protected by public nuisance are also protected by private nuisance, provided that the interference disturbs an individual in his capacity as possessor of property.

The traditional common law rule held that the complainant in a public nuisance case could bring suit as long as his damage is special, or particular to him, and not shared by the general public. This seems to be a paradox, given that public nuisance law is designed to protect the rights of the public. The government, however, may bring an action to shut down a public nuisance without showing any proof that a victim has suffered a particular harm. In other words, private individuals are denied the right to sue on the basis of the general interferences suffered by the public.

One classic example of a public nuisance is the malarial pond.³ First, consider the malarial pond as a private nuisance. If landowner *A* has a malarial pond on his property, adjacent landowner *B* will be permitted under the law to sue for damages, and probably an injunction, on the basis of private nuisance doctrine. It should be clear that a malarial pond constitutes an interference with the quiet use and enjoyment of property of an adjacent landowner. The adjacent landowner will have to stay indoors to avoid being bitten by the mosquitoes, and may have to change his daily routine in order to minimize the risk of contracting malaria. These harms are sufficient to bring a claim for private nuisance. In addition, the law implies liability when the invasion created by the malarial

² See, e.g., PROSSER, *supra* note 1, at 583-584.

³ *Mills v. Hall & Richards*, 9 Wend. 315 (N.Y. 1832).

pond is both intentional and unreasonable. It will be found to be intentional if the landowner with the pond is aware of its presence and its likely impact on the adjacent landowner. The law has failed to provide a concise definition of what it means to be unreasonable, but it is understood that this introduces a type of cost-benefit balance into the analysis. Since there are few benefits that would make it reasonable to have a malarial pond, a finding of liability would be likely in this case.

Now consider the malarial pond as a public nuisance. It interferes with the public's health as well as convenience. People who walk within the vicinity of the malarial pond are at risk of infection from the mosquitoes. If they are aware of the risk, they will change their walking routes to avoid coming close to the pond. These are substantial interferences, but they are insufficient to give a plaintiff a right to sue under public nuisance doctrine. To have a right to sue under public nuisance doctrine, the plaintiff has to suffer a particular harm that is greater than that suffered by the general public. For example, if the plaintiff suffers a mosquito bite that leads to malaria, that will be sufficient to satisfy the particular harm requirement. The requirements of intentionality and unreasonableness apply, just as in the case of a private nuisance claim.

Public nuisance law embodies the conviction that a member of the public has at least some of the rights enjoyed by landowners; or, more precisely, that there are public rights unconnected to status such as landownership or contractual promisee. It seems intuitive, however, that the rights of the public should not be as great in scope as those of a landowner. Owning land brings with it expectations of protections that ordinarily do not accompany mere existence as a member of the public. For example, landownership brings with it the protections of trespass law, which have no bearing in the case of someone who simply occupies public space.

Why should the law of public nuisance require that the plaintiff suffer a particular harm, rather than a general harm of the sort suffered by the public? One can offer intuitive arguments. The member of the public has to be willing to put up with the inconveniences that come along with that status. No one has a guarantee to comfort, convenience, or complete safety in the exercise of public rights or in connection to the occupation of public space. Some level of inconvenience has to be tolerated as part of membership in society. In addition, permitting individuals to sue for harms general to the public runs the risk of fraudulent claims. Courts cannot distinguish between those who suffered these general harms from those who suffered no harm at all. A court cannot distinguish someone who altered his route significantly to avoid coming close to the malarial pond from someone who did not have to alter his route significantly. The administrative costs of sorting valid from phony claims would be enormous.

In terms of tort doctrine, these intuitive arguments imply a different view of the implicit cost-benefit balancing observed in the private nuisance cases. When one exercises rights of the public, one must assume some of the risks associated with the exercise of those rights. This can be contrasted to the private property ownership case. When one owns a parcel of property, one expects a certain degree of protection from trespasses and other invasions that would substantially reduce the value of ownership. From an assumption-

of-risk perspective, then, it would appear that the interferences required to justify a claim for damages should be greater in the public sphere than in the private property realm. The law embodies this intuitive perspective in its distinction between the types of harm necessary to support public and private nuisance damage claims.

These are intuitive arguments for the particular harm requirement, though I will attempt to provide a more rigorous grounding for them in this paper. More importantly, I will attempt to provide a rigorous account of the function of public nuisance doctrine and its scope.

III. Understanding Nuisance Doctrine

Although commentators have suggested that public and private nuisance doctrines are sufficiently unrelated that they should have entirely different labels in order to avoid confusion,⁴ I will argue that the two doctrines are in fact closely related, and have a common theoretical core. That core can be explained on the basis of the economic model of strict liability.

In this part, I will set out the building blocks of an economic theory of nuisance doctrine.⁵ The distinction between activity and care levels is the starting point.

A. Activity Levels, Care Levels, and Externalities

The law and economics literature distinguishes care and activity levels.⁶ The care level refers to the level of instantaneous precaution that an actor takes when engaged in some activity. For example, an actor can take more care while in the activity of driving by moderating his speed or looking more frequently to both sides of the road. The activity level refers the actor's decision with respect to the frequency or location of his activity. If, for example, the activity of concern is driving, it can be reduced by driving less frequently. Alternatively, a driver can change the nature of the activity by altering its location or the technology used in it. Changing the frequency, location or technology of engaging in an activity are all methods of altering the activity level.

The invasions associated with nuisance law can be viewed as external costs associated with activity level choices. Consider, for example, a manufacturer that dumps toxic

⁴ Prosser, *supra* note 1, at 573.

⁵ The economic theory of nuisance doctrine can be traced to its brief treatment by Coase. Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960). The first detailed examination of the economics of nuisance law is that of Merrill, see Thomas W. Merrill, *Trespass, Nuisance, and the Costs of Determining Property Rights*, 14 J. LEG. STUD. 13 (1985). Building on Coase, Merrill provides a transaction-cost theory of nuisance law. More recently, the transaction cost theory has been extended by Henry Smith, see Henry E. Smith, *Exclusion and Property Rules in the Law of Nuisance*, 90 VA. L. REV. 965 (2004). The transaction-cost approach is essential for understanding the reasons trespass law cannot serve as a functional substitute to nuisance law. Moreover, some features of the scope of nuisance law, such as the general exclusion of liability for aesthetic disturbances, are best described by transaction cost theory. However, the doctrines of nuisance law reflect considerations that go beyond the transaction cost theory.

⁶ See Steven Shavell, *Strict Liability Versus Negligence*, 9 J. LEGAL STUD. 1 (1980).

chemicals into the water as a byproduct of its manufacturing activity. Suppose the manufacturer is taking the level of care required by negligence law (reasonable care), and, in spite of this, the manufacturing process leads to some level of discharge of toxic chemicals. In this case, the environmental harm is a negative externality associated with the manufacturer's activity level choice.

Whether we are considering the activity of driving a car or that of manufacturing, the model examined here is of activities that impose external costs on society even when they are carried out with reasonable care. The question I consider is how the law can regulate activity levels in a way that leads to approximately socially optimal decisions. I will argue that nuisance law appears to accomplish this goal.

I assume in the model below that there are two liability rules that can be applied to actors, strict liability and negligence.⁷ Under either rule, actors are assumed to take reasonable care.

B. The Economics of Activity Level Choices

For any activity, the actor engaged in it will set his privately optimal level at the point which maximizes his utility from that activity. That means the actor will consider the benefits he derives from the activity as well as the costs, and choose a level at which the excess of private benefits over private costs is at its maximum. If $b(y)$ represents the private benefit enjoyed by the actor at activity level y , and $c(y)$ represents the private cost, the actor will increase his activity level until

$$b'(y) = c'(y) , \tag{1}$$

where $b'(y)$ represents the marginal private benefit (*MPB*) to the actor and $c'(y)$ represents the marginal private cost (*MPC*). The actor's privately optimal activity level choice is given by the intersection of *MPB* and *MPC* in Figure 1 (point A).⁸

There are negative externalities (or external costs) associated with many activities. Suppose the activity is driving. With each mile driven, the actor imposes some risk of harm from an accident or from pollution on the public in general. Or, if the activity is manufacturing, with each widget produced, a manufacturer who discharges chemicals in the water imposes clean-up costs on others. The marginal social cost of the actor's activity is simply the sum of the marginal private cost and the marginal external cost

⁷ The model presented in this paper is based on that in Keith N. Hylton, *A Positive Theory of Strict Liability*, forthcoming REV. LAW & ECON., 2008. This model differs from the standard strict liability model in Shavell, *supra* note 6, which finds that strict liability is preferable to negligence when it is desirable to reduce injurers' activity levels rather than victims' activity levels. The alternative model presented here focuses on the relationship between externalized costs and externalized benefits.

⁸ Figure 1 assumes that marginal benefits diminish as the actor increases his activity level, which implies that the marginal private benefit schedule can be represented by a downward sloping line. Marginal private benefits decline because the actor gains less in utility from an additional unit of the activity as his activity level expands. The marginal private cost schedule is assumed to increase as the actor increases his level of activity (see *MPC* in figure 1).

imposed on society. Thus if $v(y)$ represents the external cost of the activity, the marginal social cost (MSC) is $c'(y) + v'(y)$.

1. Cost and Benefit Externalization: Single Activity Model

It is possible that there are benefits to society generated by the actor's activity. For example, the provision of water to a building, even when carried out with great care, puts the tenant's property at risk of damage from escaping water, but also benefits society by enhancing sanitation.⁹ Similarly, providing internet service to a home puts the resident's computer at risk through the transmission of computer viruses, but also enhances the spread of information across society. And consider driving again. If the number of drivers increases from one to two, both drivers will have the added safety that if anything goes wrong on the road (e.g., a car falls into a pothole), they will find someone who can help them or call for help.

The marginal social benefit is the sum of the marginal private benefit and the marginal external benefit of an additional unit of activity. Thus, if $z(y)$ represents the external benefit, the marginal social benefit (MSB) is $b'(y) + z'(y)$.

The final step of this economic analysis of activity level choices is to consider the differences between private and social incentives. Social welfare is optimized when

$$b'(y) + z'(y) = c'(y) + v'(y) \quad . \quad (2)$$

The level of activity that satisfies the social optimality condition may differ from the privately optimal level. The socially and privately optimal activity levels will be the same if the cost and benefit externalities are equal; that is, $z(y) = v(y)$. If the external cost exceeds the external benefit at all activity levels, $v'(y) > z'(y)$, then the privately optimal activity choice will exceed the socially optimal level; and the converse holds as well.

Figure 1 can be used to elaborate. Consider the case of low and roughly equivalent externalities on both the cost and benefit sides, as shown in by MSC (*low externality*) and MSB (*low externality*). The socially optimal level of activity, which equates the marginal social benefit and the marginal social cost, is found at the point B in Figure 1. The socially optimal level of activity (B) is roughly the same as the privately optimal level of activity (A). The reason is that the modest positive and negative externalities cancel each other out.

Consider the case of high externality on the cost side and low externality on the benefit side, as shown by the intersection of the MSC (*high externality*) and MSB (*low externality*), or point C in Figure 1. Now there is a wide divergence between the privately optimal level of activity (A) and the socially optimal level of activity (C). In this case it appears desirable for the government to intervene to reduce the level of activity. Indeed, in the case of very high externality on the cost side (MSC (*very high externality*)) it may be desirable to shut down the activity completely.

⁹ See *Rickards v. Lothian* [1913] A.C. 263.

Finally, consider the case of low externality on the cost side and high externality on the benefit side, as shown at point D in Figure 1. The privately optimal level of activity (A) is substantially below the socially optimal level (D). The law should intervene to increase the level of activity.

2. Cross Externalization of Costs and Benefits: Dual Activity Model

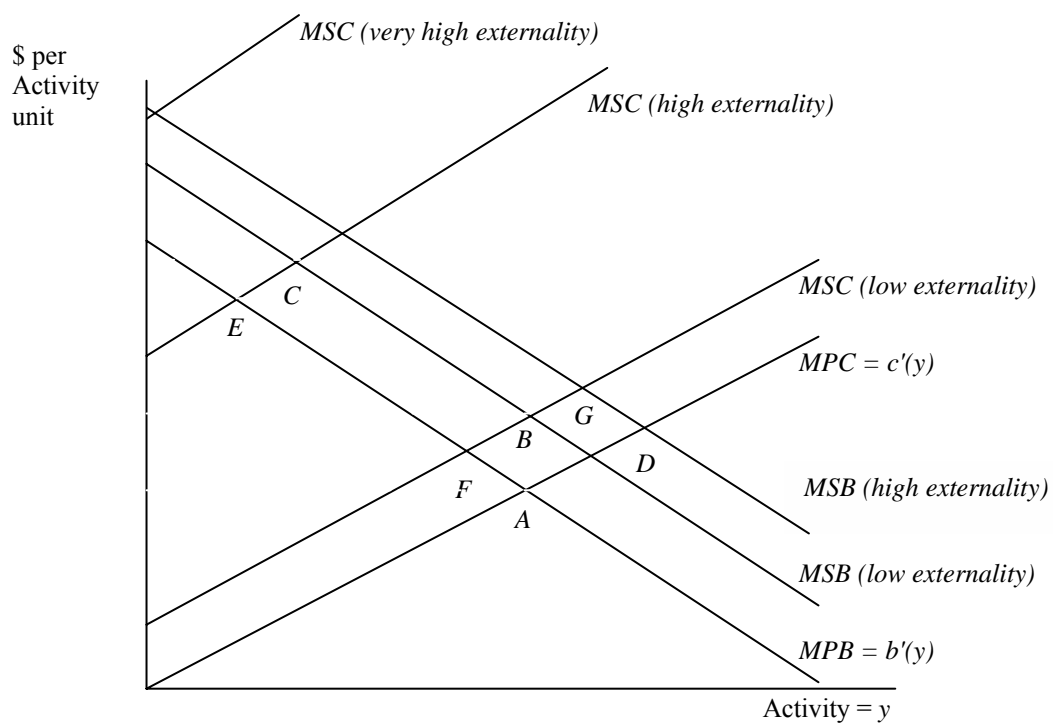
In many settings, two actors cross externalize benefits and risk. For example, on the roads, drivers impose accident risks on each other even when taking care (or they may externalize benefits). Consider two actors S and T . In the case of risk externalization, the activity cost function for S can be represented as

$$c(y_S) + v_{ST}(y_S, y_T) + v_{TS}(y_S, y_T) \quad (4)$$

where v_{ST} represents the risk externalized from S to T as a function of both activity levels and v_{TS} represents the risk externalized from T to S . Assuming, for simplicity, that no benefits are externalized, the privately optimal activity level for S will be determined by

$$b'(y_S) = c'(y_S) + \frac{\partial v_{TS}}{\partial y_S}, \quad (4)$$

and a similar result holds for actor T . It should be clear that both actors will constrain their activity levels more than in the single activity case considered above, because they will take into account the risks they incur when increasing activity. If the benefit and cost functions are the same for both actors, and $\partial v_{TS}/\partial y_S = \partial v_{ST}/\partial y_T$, they will choose the same activity levels. In the absence of externalized benefits, the privately optimal activity levels will be greater than the socially optimal levels. If benefits are externalized, then it is no longer clear that the privately optimal activity levels are socially too high. Whether the privately optimal activity levels coincide with the socially optimal levels depends on the relationship between externalized benefits and externalized costs.

Figure 1

C. Introducing the Law

Since the actors are assumed to be taking reasonable care, the negligence rule cannot influence their activity level choices.¹⁰ The negligence rule holds the actor liable only when he fails to take reasonable care. Since the actors are assumed to have taken reasonable care, the negligence rule will not lead to any findings of liability.

Strict liability has the property that it imposes liability on actors even when they have taken reasonable care. The legal system can influence activity levels through imposing strict liability. In this part, I will examine the conditions under which strict liability leads to approximately optimal activity levels.

First, consider the case in which externality is high on the cost side and low on the benefit side. The socially optimal scale in this case is point *C* in Figure 1. In the absence of strict liability, the privately optimal scale is point *A*. Imposing strict liability on the actor is probably desirable in this case. When strict liability is imposed on the actor, his marginal private cost schedule becomes equivalent to the marginal social cost schedule. In the case of high externality on the cost side coupled with low externality on the benefit side, the actor's privately optimal activity level under strict liability will be point *E*. It is not the socially optimal level, which is at point *C*, but it is close. Social welfare will most likely be improved by using liability to lead the actor to choose level *E* rather than the socially excessive level *A*. And I will argue below that there are narrower doctrines, such as proximate cause, that serve to adjust the activity level to the socially optimal point.

Now consider the case in which externality is low both on the cost and on the benefit side. The socially optimal scale of activity is associated with point *B*. The privately optimal level of activity is associated with point *A*. These are the same activity levels. If strict liability is imposed on the actor, it will reduce his activity level below the socially optimal scale, and therefore reduce social welfare. Strict liability will lead him to choose the scale *F*, which is below the socially optimal scale.

It follows from the foregoing that *strict liability is desirable in the single activity case only when the external costs of the activity substantially exceed the external benefits associated with the activity*. In this case imposing strict liability reduces activity levels to a point that is closer to the socially optimal scale than would be observed under the negligence rule. When the external benefits are roughly equal to or greater than the social costs associated with the activity, strict liability is not socially desirable.

Another case in which strict liability is not preferable to negligence is observed when two actors cross-externalize equivalent costs – the dual activity case. *When the costs*

¹⁰ This assumes courts operate without error and that litigation is not costly. If courts make mistakes and litigation is costly, compliance with the negligence standard does not reduce liability costs to zero. On litigation costs and judicial error, see Keith N. Hylton, *Costly Litigation and Legal Error under Negligence*, 6 J. LAW, ECON. & ORG. 433 (1990).

*externalized by two actors to each other are reciprocal,*¹¹ *strict liability is not socially preferable to negligence.* The reason is that under strict liability, you will pay for harms to others, while under negligence (again, everyone is complying with the negligence standard in this model) you will pay for only for the harms you suffer. Since those harms are the same, activity levels will not differ under the two regimes.

D. Application to Nuisance Law

I have presented an economic analysis of activity level choices and considered its implications for law. Now I will examine the law, to see if it conforms to the predictions of the model.

IV. Positive Theory of Nuisance Law

Nuisance law has not been articulated clearly. Of course, some parts of the doctrine are easily interpreted in light of similar tort rules. Consider the legal definition of a nuisance: an intentional, nontrespassory and unreasonable invasion into the quiet use and enjoyment of property. Intentional, in nuisance law, has always had a meaning similar to its meaning in the context of trespass law: it is enough if the defendant was aware of the nuisance, and the plaintiff is not required to prove that the defendant aimed to harm him. The term nontrespassory has always had the effect of distinguishing between invasions that interfere with exclusive possession of property or a portion of it (e.g., a boulder) and invasions that merely make it less desirable to remain in possession of property (e.g., smoke). I will go beyond these comparisons with trespass doctrine to examine how this paper's model justifies the definition and doctrines of nuisance.

A. Nontrespassory Invasions

The definition of a nuisance as a nontrespassory invasion distinguishes nuisances from trespasses and also from consensual transactions. If the interference is the result of the consent of the victim, then it is not properly characterized as an invasion.

The requirement of invasiveness is implicated by the externality model. If the interference is consensual, in the sense that the affected party is fully aware of the nature of the interference and still contracts with the offending actor, then there is no need for the law to intervene to control the activity level of the offending actor. The activity level will be regulated to the optimal level by the market. Thus, if a person contracts with another to install a noisy furnace, and he is fully aware of the noise that will be emitted by the furnace when he enters the contract, he has no basis to bring a nuisance claim against the furnace supplier for the noise interference.

¹¹ In terms of the model, this requires $\partial v_{TS}/\partial y_S = \partial v_{ST}/\partial y_S$ and $\partial v_{ST}/\partial y_T = \partial v_{TS}/\partial y_T$. If this condition holds, each actor (S and T) chooses the same activity levels under strict liability and under negligence. If the conditions $\partial v_{TS}/\partial y_S = \partial v_{ST}/\partial y_T$ and $\partial v_{TS}/\partial y_T = \partial v_{ST}/\partial y_S$ hold, then S and T will choose the same activity level (i.e., the activity level of S will equal the activity level of T) under strict liability and under negligence (horizontal equivalence across actors in each regime), but this does not imply that strict liability is equivalent to negligent (equivalence for each actor across regimes). For strict liability to be equivalent to negligence, the first two conditions above must hold.

B. Intentional Invasions

The externality model provides a theory of intent in nuisance law. The purpose of strict liability is to regulate activity levels. In order to carry out this function, liability must be applied to actors that have sufficient information to have their activity level choices influenced by liability. For example, an actor that decides to locate a smoke-belching factory next to a residential area must be aware of the invasions caused by the smoke from his factory if strict liability is going to have any impact on his initial location decision.¹²

It follows that intention in nuisance law, at its core, does not mean intending to harm the victim, or intending to interfere with the victim's use of his property. It is sufficient that the actor has enough information to either be aware of or to easily foresee the harmful impact of his activity on others.

C. Unreasonable Invasions

Perhaps the most important and unclear term in the definition of nuisance is unreasonable. There have been efforts to settle its meaning, but most of them are unsatisfying.¹³

The theory of this paper suggests a clear interpretation for the reasonableness test of nuisance law. The model presented in the previous part suggests that an unreasonable invasion is one that is associated with an activity for which: (a) the external costs substantially exceed the external benefits, or (b) the external costs thrown off by the defendant's activity are not reciprocal to the external costs thrown off by other local activities.¹⁴ These two conditions describe the settings in which the law should intervene

¹² It is quite likely that strict liability will have ex post effects on an actor's scale or location decision. After moving to a location, the burden of strict liability probably would induce a nuisance generator to scale back its activity and perhaps to move it to another location, even if the generator was not aware of the costs imposed on victims. However, strict liability cannot affect ex ante incentives if the generator is unaware of the costs externalized to victims.

¹³ For example, the Restatement (Second) Section 826 says:

An intentional invasion of another's interest in the use and enjoyment of land is unreasonable if:
 (a) the gravity of the harm outweighs the utility of the actor's conduct, or
 (b) the harm caused by the conduct is serious and the financial burden of compensating for this and similar harm to others would not make the continuation of the conduct not feasible.¹³

Restatement (Second) of Torts: Unreasonableness of Intentional Invasion § 826 (1977). This definition is questionable because it refers to the actor's conduct rather than his activity. The core question is whether the actor's activity is one that imposes too many risks on others given its benefits (or given the costs reciprocated by others). The second provision of Section 826 is almost useless, because it implies that strict liability should apply to any nontrivial interference with a person's use and enjoyment of land.

¹⁴ Many of the activities subjected to strict liability can be viewed as aggregations of risk rather than as different in kind from ordinary risks. For example, the risk created by storing explosives is simply an aggregation of the risk anyone creates by storing something that can explode. The unusual risk creation

to reduce an actor's activity level. Provided that the intentionality and nontrespassory descriptions apply to a particular invasion, the law should impose strict liability when the external costs exceed external benefits or are non-reciprocal.

Nuisance doctrine is closely related to the law and theory of strict liability articulated in *Rylands v. Fletcher*.¹⁵ The *Rylands* court described several nuisance cases as falling within the rationale of its decision. This is useful because the law on *Rylands*-based strict liability has been set out with much greater clarity than nuisance law.

Using the theory of *Rylands* as the closest doctrinal source for nuisance law, we can set out the following test for a nuisance:

- (a) existence of a high degree of interference with the quiet use and enjoyment of land of others;
- (b) inability to eliminate the interference by the exercise of reasonable care;
- (c) extent to which the activity is not a matter of common usage;
- (d) inappropriateness of the activity to the place where it is carried on and;
- (e) extent to which its value to the community is outweighed by its obnoxious attributes.

I will refer to this below as the *nuisance test* (or the five-factor test). These factors are based on the Restatement's articulation of the *Rylands* doctrine in the form of a set of rules, in Section 520. The foregoing five-factor test is an attempt to examine whether the external costs thrown off by a nuisance substantially exceed external benefits, or are reciprocated by background external costs of other activities.

The first two factors of this test require that the interference be substantial even when the actor is taking reasonable care. As in the case of abnormally dangerous activities, the first two factors should be treated as minimal requirements for nuisance liability. If, in other words, the interference would be trivial if the actor took reasonable care, then the interference should not be considered a nuisance, and there is no need to examine the remaining factors of the test.¹⁶

The remaining three components present the core of the reasonableness test in nuisance law. The third factor, common usage, helps identify activities for which the risks are reciprocal to those of other common activities. If an activity is one of common usage, then actors engaged in those activities will impose reciprocal risks on each other, and there is no basis for adopting strict liability over negligence.

that justifies strict liability can therefore be viewed as an aggregation or consolidation of risks which are ordinarily confronted in a dispersed and uncorrelated form.

¹⁵ L.R. 3 H.L. 330 (1868). The *Rylands* case treats ultrahazardous and nuisance cases as all part of the same general doctrine. On the connection between *Rylands* and nuisance doctrine, see also Hylton, Positive Theory of Strict Liability, *supra* note 3.

¹⁶ Judge Posner's decision in *Indiana Harbor Belt R.R. v. American Cyanamid Co.*, 916 F.2d 1174 (7th Cir. 1990), an ultrahazardous activity strict liability case, is consistent with this proposition.

The fourth factor, inappropriateness, is both another way of determining whether the activity imposes a reciprocated risk and a way of assessing whether the risks are balanced off by the external benefits. Since the fourth factor focuses on the location, it should be treated as a type of assumption of risk test. An activity would be considered appropriate for its location if its costs are typical of other activities in the locale, or if its external benefits would make it reasonable for someone in the area to tolerate the costs.

The last factor asks the court to compare the benefits externalized by the activity and the costs externalized. When the benefits are substantial, the last factor suggests that the court should be reluctant to impose liability on a nuisance theory. Consider, for example, the noise generated by a fire station. Suppose it is a particularly busy fire station. The noise generated by fire trucks constantly moving in and out of the station with their alarms running could be deemed to substantially interfere with the quiet use and enjoyment of land by neighbors. However, the neighbors also benefit by being located close to the fire station. Since those benefits are substantial and widely dispersed, the neighbors should not be allowed to impose strict liability on a nuisance theory against the fire station. There is no economic basis for using liability as an incentive to force the fire station to cut back on its activity or to reconsider its location decision.

The cases in which courts have balanced external costs and external benefits are relatively few. In *Baines v. Baker*,¹⁷ the defendants proposed to erect a hospital for treating smallpox patients in Coldbath Fields, London. The plaintiff, an owner of rental property in the area, sued to enjoin the building as a nuisance. The court refused to grant an injunction on the ground that the plaintiff's property-value losses due to fears, even though rational, were not recoverable through a nuisance action; and that the public benefits of the hospital would justify the external costs. Lord Hardwicke said, "I am of opinion that it is a charity likely to prove of great advantage to mankind. Such an hospital must not be far from town, because those that are attacked with that disorder in a natural way may not be carried far."¹⁸

The most famous and controversial American nuisance case involving the balancing of external costs and benefits is *Pennsylvania Coal Co. v. Sanderson*.¹⁹ The defendants operated a coal mine, and in the process of operation brought up underground water. The water brought up by the mining operation flowed into and polluted a surface stream that was used, three miles away, by the plaintiff as a source of water for "domestic purposes".²⁰ The court described the case as pitting the interests of the leading industry of the state against riparian property owners. It also characterized the case as a purely

¹⁷ (1752) Ambler 158; for a summary, see Nathaniel Cleveland Moak & John Thomas Cook, Reports of Cases Decided by English Courts: with Notes and References, 1884, at 368-69, text available online at: <http://books.google.com/books?id=i3UyAAAAIAAJ>.

¹⁸ Id. at 159.

¹⁹ 113 Pa. 126; 6 Atl. 453 (1886). For an insightful discussion that anticipates my treatment of *Sanderson*, see Todd J. Zywicki, *A Unanimity-Reinforcing Model of Efficiency in the Common Law: An Institutional Comparison of Common Law and Legislative Solutions to the Large-Number Externality Problems*, 46 CASE W. RES. L. REV. 961, 1017-1020 (1996).

²⁰ 6 Atl. at 454.

private nuisance, not affecting general access to usable water, because the community had “abundant pure water from other sources.”²¹ The court held that

[m]ere private personal inconveniences, arising in this way and under such circumstances, must yield to the necessities of a great public industry, which, although in the hand of a private corporation, subserves a great public interest. To encourage the development of the great natural resources of a country trifling inconveniences to particular persons must sometimes give way to the necessities of a great community.²²

In an explicit reference balancing externalities, the court concluded its opinion by quoting approvingly from a dissent in one of the earlier decisions in the same case:

The population, wealth, and improvements are the result of mining, and of that alone. The plaintiffs knew, when they purchased their property, that they were in a mining region. They were in a city born of mining operations, and which had become rich and populous as a result thereof. They knew that all mountain streams in that section were affected by mine water, or were liable to be. Having enjoyed the advantages which coal mining confers, I see no great hardship, nor any violence to equity, in their also accepting the inconveniences necessarily resulting from the business.²³

It should be clear that the externality balancing test, in isolation, implies a movement toward expanding strict liability as an economy becomes wealthier. For a subsistence level economy, the introduction of industry should have enormous beneficial externalities. But as the wealth and industry expand, the positive externalities of industrial expansion probably diminish.²⁴ And wealthier consumers will attach a greater valuation to recreational and aesthetic interests. Thus, *Sanderson* may have been a case of its time, and rather near the end of it too.

D. Scope of Liability: Extra-Sensitive Plaintiffs, Proximate Cause, and Coming to the Nuisance

Nuisance law does not provide for compensation to the extra-sensitive plaintiff, such as one who complains of illnesses caused by such ordinary activity as the ringing of church bells.²⁵ The justification for this well-settled piece of the law is best understood in terms of the model of this paper. A nuisance exists when the externalized costs associated with an activity are substantially in excess of externalized benefits, or the externalized costs

²¹ *Id.*, at 459

²² *Id.*

²³ *Id.*, at 465.

²⁴ In particular, the positive externalities created by the enhancement of market infrastructure and other social benefits from industrialization diminish. However, even in a wealth, industrialized economy, there may be commercial activities that throw off external benefits. For example, information technology, by enhancing the dissemination of information through society, carries significant positive externalities.

²⁵ *Rogers v. Elliott*, 15 N.E. 768 (Mass. 1888).

are not reciprocated by other background activities. The comparison of externalized costs and benefits is made with respect to statistical averages, not to any particular plaintiff. If, on the basis of statistical averages, the externalized costs associated with an activity are not substantially greater than the externalized benefits, then the activity is not a nuisance under the theory here, even though an individual within the community might suffer an injury from it.

The extra-sensitive plaintiff problem is closely related to the scope of nuisance law, or, in legal terminology, proximate causation. Courts have limited the scope of nuisance liability to injuries that are connected in a predictable way to the externalized risk. Injuries that are not predictably related to the externalized risk are not within the scope of strict nuisance liability. The externality model suggests a reason for this: to focus liability on the cost externalizing features of the defendant's activity rather than the activity per se. Suppose the victim drives his car into the defendant's malarial pond. To permit a strict liability action in this case would fail to tax the defendant's activity for the specific risk creation that the law aims to discourage.

A more detailed justification for the proximate cause rule in nuisance law, and in strict liability generally, can be gleaned from the model of the previous section. The externalized risk component, $v(y)$, can be considered to consist of two subcomponents, $v_1(y) + v_2(y)$, where $v_1(y)$ is the normal risk externalized by activities of the defendant's type and $v_2(y)$ is the special additional risk that makes the defendant's activity a nuisance. For example, in the case of a malarial pond, $v_1(y)$ is the risk externalized by any water storage, and $v_2(y)$ is the malaria risk. The proximate cause rule excludes liability for the normal risk component.²⁶ If, as nuisance law implicitly assumes, normal risks are balanced off by positive externalities, then excluding liability for normal risk leads to optimal activity levels. In terms of Figure 1, the proximate cause rule leads the actor choose the activity level associated with point *C* rather than point *E*.

Sometimes defendants argue that plaintiffs should not be able to recover because they "came to the nuisance". The coming to the nuisance defense is valid in some cases, but not in all. The model of this paper provides a justification for the ambiguous treatment of the coming-to-the-nuisance defense. As a general matter, strict nuisance liability hinges on a comparison of externalized costs to externalized benefits (or to reciprocal background risks).²⁷ The historical pattern should not be controlling. However, whether

²⁶ In a more complicated model, there is another component of risk that would also be excluded. When the special risk of the defendant's activity is realized, there will often be remote injuries associated with it. For example, a defendant who engages in blasting may generate harms that are caused by the blasting (in the "but for" sense), but that are remotely connected at best (e.g., suppose the victim is surprised by and watches the blasting, causing him to be late to a meeting, or to get hit by a bolt of lightning). The law excludes this component of risk also. The explanation suggested by this model is that the exclusion avoids over-internalization. If such risks were not excluded, courts would be required to hold defendants strictly liable for every injury that can be traced in a but-for sense to the special risk generated by the defendant's activity. That would be an infinitely large set of risks.

²⁷ In this model, the balance of externalities determines whether strict liability is appropriate. This may seem inconsistent with Coase's analysis. Coase famously described nuisances as instances of conflicting uses of property, and suggested that either use (the defendant's or the plaintiff's) could be viewed as the interfering activity. In this model, the interfering activity is easy to identify: when the external costs of an

a victim moved to a nuisance is often important in determining whether externalized costs are unreasonable. A victim's knowing and voluntary decision to move to the nuisance is evidence that he does not perceive the externalized costs to be greater than the externalized benefits. For this reason, the coming-to-the-nuisance factor remains a relevant consideration in the balancing test for nuisances.

E. Malarial Ponds Revisited

1. Nature of Invasion, as Private and as Public Nuisance

The five-factor nuisance test can be applied to the case of a malarial pond as a private nuisance. Since the test addresses the reasonableness of an invasion, the first question that should be considered, before applying the test, is that of intent. The malarial pond could be intentional in either of two senses. The first, which is typical of nuisance cases, is that the defendant is aware of the existence of the pond and the likely negative externalities. The second is that the defendant is not only aware of the pond, but has prepared it for the purpose of inflicting harm on adjacent landowners. If this latter sense of intent is consistent with the evidence, the plaintiff might prevail on an offensive battery claim, since preparing a malarial pond for injuring a neighbor is indistinguishable from poisoning the neighbor's food. But I will assume for the remainder that the first sense of intent applies, which is sufficient to support a nuisance claim.

A malarial pond would appear to be something that could be avoided with reasonable care, but suppose the burden of preventing the formation of such a pond is extremely high for the defendant; perhaps because the defendant is not present at his property for long periods, or because his business involves frequent excavations on the property. If the burden of preventing the creation of such a pond is extremely high, it may be difficult to hold the defendant negligent for his failure to maintain the property. As long as the defendant has not created the pond with the purpose to injure neighbors, nuisance rather than negligence would appear to be the appropriate claim. This disposes of the first two factors of the nuisance test.

The third factor of the test asks whether the malarial pond is a common activity. In the deep South during slavery, slaveowners flooded their rice fields, and then fled their plantations during the summer because of the risk of malaria.²⁸ In that setting, perhaps one could argue that the malarial pond was a common activity, and a costly but necessary feature of the local agricultural industry. But outside of such a special case, the malarial pond is an uncommon activity.

The fourth factor asks whether it is appropriate to say that the plaintiff assumed the risk because of the location of the nuisance. Perhaps so in a community in which malarial ponds were a common byproduct of local industry. In such a community, one could

activity substantially exceed the background level of reciprocal external costs, or when they are far in excess of externalized benefits, then the activity is properly viewed as "interfering" and a candidate for strict liability.

²⁸ See, e.g., William Dusingberre, *Them Dark Days: Slavery in the American Rice Swamps* 54 (2000).

argue that the benefits of local industry made the risk of malaria a necessary cost of doing business. Outside of such a setting, the assumption of risk theory would be inappropriate.

The final factor looks directly at the positive and negative externalities. Where a local industry becomes the backbone of a local economy, the beneficial externalities are likely to be substantial. Many of the external benefits will be capitalized in asset values. But complete capitalization of the value of all of the beneficial externalities is unlikely. Two obvious beneficial externalities that are associated with industrialization are knowledge spillovers and the support of a market infrastructure. These benefits have to be taken into account in evaluating the net social harm from an industry that produces a substantial negative externality. In the case of malarial ponds, most industries will fail this test. Indeed, even the example of southern coastal agriculture during slavery may have failed the test, since the slaveholders typically fled their farms and left their slaves to suffer the burden of disease.

The foregoing analysis applies straightforwardly to the public nuisance setting, and also suggests that there is a common core to the public and private nuisance doctrines. While private nuisance protects a possessor of property, public nuisance protects an individual in the exercise of public rights unconnected to land ownership or any other special legal status. The “public plaintiff” is assumed by the law to have a right to exercise public rights (e.g., to travel on public roads, to occupy public space).

The theory presented here provides a justification for the rights protected by public nuisance doctrine. They are the same rights protected by private nuisance doctrine. The model of this paper identifies a nuisance by the balance of external costs and external benefits. This has nothing to do with the status of the plaintiff, as long as the plaintiff is capable of experiencing the positive and negative externalities created by the defendant. In other words, the externality-based theory of nuisance doctrine suggests that the law aims to discourage nuisance activities, not to protect specific types of victim. Whether the victim is sitting on adjacent land or roving about, the goal of the law should be the same.

In this model, the same factors considered above would point to the conclusion that the malarial pond is an intentional and unreasonable invasion of public rights, specifically the rights to be free from an offensive contact and to travel about on public roads. The malarial pond does not imprison the public plaintiff because he is free to travel to his destination by other routes. But it severely interferes with the exercise of public rights, just as it would severely interfere with the quiet use and enjoyment of property by an adjacent landholder.

2. Particular Harm Requirement

The only remaining part of public nuisance doctrine that needs to be explained is the rule that prevents the plaintiff from suing unless he has experienced a loss that is particular and not common to the public. In the malarial pond case, the particular harm requirement would be satisfied by a plaintiff who suffers a mosquito bite that results in malaria.

Why not allow any person who has suffered an inconvenience from the existence of the malarial pond to bring suit under public nuisance doctrine? I have already noted the *verifiability problem*; the administrative difficulty of distinguishing false from valid claims when the plaintiff asserts that he has suffered merely an inconvenience. A victim who claims that he had to alter his route to avoid the risk of malaria cannot be distinguished easily from one who did not suffer such a cost. This is probably a sufficient reason for the particular harm requirement.

Another administrative argument for the harm requirement is based on *operational deterrence*. The common harms suffered by victims of public nuisances are typically insufficiently harmful to the average victim to justify an expensive lawsuit. Only the rare individual will find it worth his time and money to bring a lawsuit over the inconvenience of having to alter his route or to swat mosquitoes. In light of this, the common law rule barring claims for common harms could have served the function of locating standing to sue in a single actor, the state, that would presumably sue to prevent the aggregate harm. Since few individuals would have an incentive to sue, underdeterrence would be the practical result of a public nuisance regime that relied on individual claims to bring about optimal deterrence. This is also a sufficient reason for the particular harm requirement.

However, suppose these administrative concerns could be avoided. Is there still a reason suggested by the theory of nuisance doctrine for denying common harm claims?

The argument from theory runs as follows. The inconvenience of having to change one's route or to swat mosquitoes is indistinguishable from normal background inconveniences experienced in the exercise of public rights. From the perspective of the public plaintiff, the costs externalized by the malarial pond are not substantially different from the costs occasionally externalized by other activities. Plenty of other activities might require the public plaintiff to alter his route or to swat flies away. The only difference in the case of a continuing interference, such as a malarial pond, is one of frequency. At some point, frequency of interference from a particular source can pose such a serious invasion that it becomes distinguishable from background inconveniences. But this line is difficult to determine as a general matter and will vary with characteristics of the plaintiff that are unobservable to the court (e.g., how the plaintiff uses the road).

It follows that under the externality-based theory presented here the default rule should deny the strict liability claim of a plaintiff who complains about common interferences. These would fall in the category of reciprocal harms examined in the model above – reciprocal in the sense that they are indistinguishable from normal background interferences. People exercising public rights often interfere with each other's exercise of those rights, as when a driver's car breaks down and blocks traffic. However, if the interferences rise to the level that the plaintiff can demonstrate a harm that is substantially greater than that of others exercising the same public right, then the particular harm requirement should be considered satisfied. For example, suppose the plaintiff has a business that depends on his ability to exercise a public right – such as travel on a particular road – and the interference effectively prevents the plaintiff from exercising that right.

The key to this argument is that the background level of interference from activities is generally greater (though not in all cases) in the exercise of public rights than in the exercise of private property rights. Since the background interferences are greater generally, a larger number of activities that interfere with those rights will throw off external costs that are reciprocal in nature to the routine background interferences observed in the public setting. This argument is based on statistical averages, and treats the public sphere the same as a private setting in which a relatively high level of interferences were common and reciprocally shared.

This is still consistent with the view that an excessively sensitive plaintiff cannot collect damages. The reason is that if, on statistical averages, the interference is one that would not trouble the ordinary individual exercising public rights, it will not provide a basis for a plaintiff who is unusually sensitive to claim damages under public nuisance doctrine.

The theoretical case for denying the strict liability claim when the interferences suffered by the plaintiff are common to the public rests on both the administrative grounds (specifically, inability to tell whether the plaintiff suffered any interference and the operational underdeterrence) and the higher level of background interference in the public sphere. In spite of this, it is clear that the aggregate interference created by activity such as a malarial pond will be greater and more concentrated than the typical random interference. This implies that if all of the public plaintiffs sued as a class, or the state sued on their behalf, the strict liability claim should be permitted – provided all of the conditions examined in the nuisance test are satisfied.

F. Error Costs and Shut Downs

If damage payments accurately reflected all of the losses suffered by victims, there would never be a need to issue an injunction. Notice that in Figure 1 if external costs are very high and external benefits are nonexistent, the optimal scale of the offending activity is zero. If damage awards correctly captured all of the losses suffered by victims, every case involving extremely high external costs would be shut down, in effect, by damage awards.²⁹ Given this, why are injunctions ever issued?

The economic case for injunctions is that damage awards do not compensate for all of the losses suffered by victims of nuisances. The more specific reasons differ in the private and public nuisance settings. In the private nuisance setting, a sufficiently offensive invasion will impose large subjective losses on victims. For example, suppose the offending activity sends so much black smoke over the plaintiff's property that it is impossible to live on the property. Then the defendant has effectively seized the property of the plaintiff. A damage award in this case would compensate the plaintiff for the market value of the property, but not for the subjective loss from expropriation. The injunction is preferable because it forces offending activities to either pay for the full losses (objective and subjective) or shut down.

²⁹ See, e.g., A. Mitchell Polinsky, *Resolving Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies*, 32 *Stan. L. Rev.* 1075 (1980).

In the public nuisance setting, it should be clear that damage awards will fail to compensate plaintiffs for all of their losses. The rule governing damages does not provide compensation for ordinary inconveniences. However, even if victims could be compensated for ordinary inconveniences, most would not sue because the cost of suit would be too high relative to the likely damage awards. Given this, the injunction is socially preferable.

The injunctions can be viewed in both cases as minimizing error costs. Damage awards could in theory lead to optimal shut down decisions, but the types of error built in to the strict liability system are obvious. Subjective losses are not compensated in the private nuisance cases and the standard inconveniences are not compensated through public nuisance lawsuits. Because of these gaps, nuisances that should be shut down may easily escape that outcome in a system in which courts applied only liability rules to nuisance activities.

V. Modern Enforcement Actions

A. Lead Paint

Public nuisance lawsuits have become attractive to government enforcement agents as a method of resolving the costs of lead paint abatement.³⁰ Lead paint has been banned since 1978, but it remains in many homes. Public nuisance lawsuits have been brought against lead paint manufacturers in Missouri,³¹ New Jersey,³² and most recently Rhode Island.³³ In this part I will ask whether the lead paint lawsuits are consistent with the theory of nuisance law, taking a generous view of the plaintiffs' claims.

The traditional private nuisance is a smoke-belching factory, and traditional public nuisances are things like malarial ponds or highway obstructions. The lead paint litigation seems at first glance not to fit in either of the traditional nuisance categories. Unlike the smoke-belching factory, lead paint does not waft over and engulf the homes of victims. Many of the victims contracted to have their homes coated in lead paint. And unlike the highway obstruction or malarial pond, the lead paint coatings did not interfere with public rights in general; the paint interferes with rights associated with private property ownership. In addition, many of the owners of homes coated in lead paint made a decision to purchase the homes, an example of "coming to the nuisance"; and the risk of harm is a function of the care taken by victims. Many of these distinctions could be sufficient to remove the lead paint cases from the nuisance category.

³⁰ See, e.g., Howard Markel, Getting the Lead Out: The Rhode Island Lead Paint Trials and Their Impact on Children's Health, *Howard Markel*, 297 *JAMA* 2773, June 27, 2007 (discussing health problems caused by lead paint and history of litigation).

³¹ *City of St. Louis v. Benjamin Moore & Co.*, 226 S.W.3d 110 (Mo. 2007) (rejecting public nuisance claim because of failure to identify responsible actors).

³² *In re Lead Paint Litigation*, 191 N.J. 405, 924 A.2d 484 (2007) (rejecting public nuisance theory as precluded by New Jersey statute requiring lead paint abatement by property owners).

³³ *State v. Lead Indus. Ass'n*, 2007 R.I. Super. LEXIS 32 (Feb. 26, 2007).

Start with the obvious distinction between clouds of smoke, the most traditional type of nuisance, and lead paint. Smoke, fumes, and noise have the property that they make it undesirable to remain on your property. Lead paint, in contrast, does not appear to drive people from their homes, or substantially interfere with the use and enjoyment of property. But this is a questionable distinction. If we focus instead on the nature of the injury, then nuisance doctrine is a potentially reasonable fit. The victims of lead paint claim that they live with the continuing risk of injury to their children from consuming paint chips, and there is no obvious public benefit to offset this risk. If a cloud of smoke caused the same continuing risk, we would have no trouble calling it a nuisance.

1. Public versus Private

The distinction between the invasion of public and private rights is also unimportant in the lead paint context. Many public nuisances are also private nuisances. A malarial pond interferes with public rights as well as private property rights. As noted earlier, one of the administrative reasons for the particular harm requirement in public nuisance law is the operational underdeterrence that would be observed when many victims suffer a low level harm – as in the case of people inconvenienced by the existence of a malarial pond. Few of the victims of inconvenience – those forced to change their routes and to swat mosquitoes – would have an incentive to bring suit. For this reason, public nuisance doctrine appoints the state as litigant on their behalf.

The characteristic of many victims suffering low-level harms is certainly observed in the lead paint crisis. For the victims whose children have ingested lead paint and suffered injury as a result, their harms would satisfy the particularity requirement. However, probably most of those living in lead paint coated homes have not suffered serious injuries, and would therefore have little incentive to sue. On operational deterrence grounds, the treatment of lead paint as a public nuisance is defensible.

2. Intervening and Contributory Conduct

One set of special issues in the lead paint cases revolves around contributory conduct on the part of the victims, and intervening conduct by others (e.g., landlords). For one, the lead paint entered the homes by the consent of previous owners. Because of this one could argue that the lead paint nuisance is not the result of any invasion at all.

As a basis for distinguishing lead paint from traditional nuisance cases, the contractual nature of the original entry is a contestable argument. Even if the victim consented to the invasion, he may have a valid basis for a nuisance claim if he did not have any forewarning of the type of interference that would result.³⁴ In other words, risk externalization resulted from informational asymmetry in this setting. Alternatively, one could argue that the plaintiffs came to the nuisance because they purchased homes with lead paint. This may be true of new victims; presumably the market has incorporated any

³⁴ See, e.g., *Vogel v. Grant-Lafayette Electric Cooperative*, 548 N.W.2d 829 (Wis. 1996).

negative price effects due to lead paint today.³⁵ But the market was unlikely to be effective at regulating the scale of lead paint coatings before the 1978 ban because consumers were unaware of the risks.

The contributory negligence of third parties or victims in lead coated homes is another basis for distinguishing the lead paint cases from traditional nuisance cases. In the standard nuisance cases, the victims can do little to avoid the interference as long as they remain on their properties. In the lead paint setting, the victims can avoid the harm by ensuring that their children do not consume paint chips or by maintaining their homes. Moreover, there are third parties, specifically landlords, who by maintaining their properties can virtually eliminate the risk that residents are exposed to lead paint.

Returning to the theory of nuisance doctrine, this is an important distinction. If the residual risk from an activity is negligible when actors take care, then strict liability is inappropriate. There is no need to use strict liability to reduce the scale of an activity when it imposes no extraordinary risk when conducted with reasonable care. In the case of apartment tenants exposed to lead paint, landlords are presumably the parties who have a duty to minimize the risk.

In the case of direct victims, their possible contributory fault is not entirely effective as a basis for distinguishing lead paint from traditional nuisance cases. It may be prohibitively expensive for relatively poor parents to prevent children from being exposed to and consuming paint chips. The residents in lead coated buildings are, at least arguably, in the same position as landholders facing invasive smoke from a nearby factory.³⁶

3. Core Issues

Under the theory set out in this paper, strict nuisance liability is desirable because it discourages the scale of an activity with negative externalities. The lead paint was applied long ago, largely before the full risks were known, and is currently banned. There is little possibility now that strict nuisance liability will do anything to discourage the use of lead paint. The primary function of the existing lawsuits will be to redistribute resources from defendants to the firms hired for abatement purposes and to owners of

³⁵ Interestingly, there is virtually no statistical evidence of a market discount. Randall Lutter & Elizabeth Mader, *Litigating Lead-Paint Based Hazards*, in *Regulation Through Litigation*, 106-136 (W. Kip Viscusi, ed., 2002). The likely reason is that houses in relatively wealthy communities are continuously renovated by owners. The pre-1978 houses in those communities are not substantially affected by the existence of lead coatings from earlier years. The lead coatings have been removed or painted over to the point that the risk of lead exposure is low. The lead paint problem is largely one of homes and rental housing in relatively poor areas.

³⁶ I am taking a sympathetic view of the plaintiffs' claims. A less sympathetic view would assert that the danger is a function of home maintenance, and that anyone who fails to maintain a home will over time expose the residents to hazards. This implies that with respect to victims who own their homes, lead paint should not be treated differently from any number of potential hazards that might appear within the home. Under this less sympathetic view, the plaintiffs' strict liability claims should be dismissed on causation grounds. With respect to victims who are tenants in apartment buildings, the incentive to maintain will be considerably weaker.

lead coated homes.³⁷ Unlike the previous considerations, this is a fundamental distinction between the lead paint problem and standard nuisance cases.

One could argue that since the market did not effectively discourage the use of lead paint, because its dangers were largely unknown to consumers, strict liability is necessary to regulate the scale of its use. That would be a valid argument for applying nuisance doctrine to the lead paint problem if lead paint were still in use today. But it is not in use. The lawsuits come roughly a generation after the ban on lead paint.

Still, one could argue that liability even 30 years after the use of a dangerous product could serve a useful incentive purpose if the actors responsible for it could be identified. On the assumption that the responsible actors were rational and forward looking, this is an acceptable argument. Even if the penalty falls 30 years after the offensive act, it still may be proper on incentive grounds to apply the penalty.

Holding lead paint sellers strictly liable could have the appropriate incentive effects, though under some rather restrictive conditions. First, the sellers responsible for the current lead problem would have to be identified to a reasonable degree and liability would have to be allocated in a manner that tracks each seller's contribution to the risk. Second, the financial link between the existing defendants and the ones who initially sold the lead paint would have to be strong enough that applying strict liability today could be viewed as having an incentive effect on the initial sale decision. Third, the liability would have to be limited to those actors, or the successors to those actors, who sold lead paint with knowledge of its risks to homeowners. These are difficult conditions to satisfy.

4. Identification and Causation

The common law, with doctrines such as *res ipsa loquitur* and the alternate liability rule of *Summers v. Tice*,³⁸ long ago moved away from a strict requirement that every injury be linked to an identifiable defendant. More recently, market share liability theories have moved the law further in the direction of permitting liability findings against actors who are identified with plaintiffs' harms primarily through statistical inference.

The lead paint cases attempt to stretch the modern causation doctrines to new limits. One case to reject such an attempt is *Skipworth v. Lead Industries Association*.³⁹ The court rejected the application of market share liability to lead paint defendants on the ground that market share statistics are only weakly correlated with the risks externalized by lead paint. Not all lead paints are equally harmful. The degree of bioavailability of lead differs among types of lead paint.

³⁷ The gains to home owners probably make up a minimal part of this wealth transfer. If a relatively poor owner is informed that his home is defective and he must vacate it to allow for abatement, that will present an enormous expense to the homeowner. By far the cheapest method of curing the problem would be to hire a painting crew to paint over the lead coated portions, but that probably would be considered an impermissible form of abatement.

³⁸ 199 P.2d 1 (Cal. 1948).

³⁹ 690 A.2d 169 (Pa. 1997).

This paper's model suggests that statistical theories of causation and identification are appropriate for nuisance claims generally. The essence of a nuisance, and of strict liability theories across the board, is that the defendant's activity throws off external costs, even when conducted with reasonable care, that are substantially greater than those of other local activities or substantially greater than any benefits externalized by the actor. Since the focus is on risk externalization, liability can be allocated according to a statistical identification of risk sources.

For example, suppose two malarial ponds owned by different defendants create a public nuisance within a single community. Suppose, in addition, that the plaintiff satisfies the particular harm requirement of public nuisance law, because he has contracted malaria from a mosquito bite. Rather than require the plaintiff to identify the pond from which the disease-carrying mosquito attacked the plaintiff, it would be preferable to use some method of allocating liability based on relative risk externalization by the two defendants. Relative risk externalization might be measured by the relative sizes of the ponds. As long as the relative risk measure achieves an acceptable degree of statistical accuracy, the damage judgments will be allocated among the defendants in a manner that provides optimal deterrence incentives.

Although statistical causation and identification methods appear to be preferable in general in public nuisance settings, the lead paint cases introduce additional hurdles. A market share liability approach fails as a measure of relative risk externalization among defendants, for many reasons. Market shares within the relevant geographic market may differ from national market shares. Market shares change over time. The level of bioavailability of lead differs among types of lead paint. Because of the passage of time and corporate reorganizations, the link between existing defendants and the actors responsible for the risk is often weak.

Market share liability seems, at first glance, to have the same appeal, as a solution to the liability allocation problem in the lead paint context, as does the approach of allocating liability for malaria according to the relative sizes of malarial ponds. However, market shares have changed over the century or so of lead paint use, while malarial ponds are fixed in relative size during the period of injury. In addition, there is heterogeneity in the risk externalized by each lead application within each generation, and the risk has changed with each generation of application. Perhaps these statistical difficulties are not insurmountable, but they certainly make the task of statistical allocation of liability far more difficult than in the standard market share liability case.

This is not necessarily the end of the matter. If there is a random link between the imposition of liability and the level of risk thrown off by actors, strict liability could still serve a useful incentive function. Suppose, for example, that a group of offending actors can determine the average risk externalized by their activities as a mass, but not the specific risk externalized by each actor. An allocation rule for damages that tracks average risk externalization, though failing to accurately capture relative risk externalization, might still provide the right activity incentives. In other words, even

though different types of lead paint may generate different levels of risk based on bioavailability, it may be that the lead paint manufacturers were aware only of the mean risk externalization at the time of marketing. An allocation of damages based on mean externalization would be responsive to their incentives.

The danger in using a random allocation is observed where some offending actors have intentionally adopted activities that externalize relatively low risks. Those actors will be punished too harshly under the random allocation rule and the most offensive actors will be punished too lightly. If it is costly to reduce the level of risk externalization, a random allocation method will have the perverse effect of encouraging the most offensive levels of risk externalization.

5. Intention and Incentives

This paper's model implies that the intentionality requirement serves an important incentive role in strict liability doctrine. If the actor is not aware of or cannot foresee the costs externalized to others, then strict liability cannot influence the actor's incentives. This is the reason nuisance doctrine imposes an intentionality requirement.

It is alleged that there was a period in which lead paint sellers were aware of and hid the risks of their products.⁴⁰ However, that period, if it exists,⁴¹ represents only a portion of the history of the use of lead paint.⁴² Strict nuisance liability can be justified on economic grounds only for the actors who marketed lead paint within the time period in which the risks were known (or should have been known) by the actors – an issue commonly referred to as the “state of the art” defense. If the average bioavailability level of lead in 1950 was considered safe for consumer use at that time, it would be inconsistent with the theory of nuisance liability to hold the sellers who met that industry

⁴⁰ See, e.g., Richard Rabin, The lead industry and child lead poisoning. *Synthesis/Regeneration*. 2006;41:1-10. <http://www.greens.org/s-r/41/41-02.html>.

⁴¹ Knowledge on the part of the industry that lead paint is poisonous does not immediately imply knowledge of the risks currently documented. One of the interesting features of the lead paint problem is the increasingly stringent safe exposure thresholds established by the federal government. See Lutter & Mader, *supra* note 35, at 125. These increasing standards imply that a level of lead that might have been considered safe in, say 1950, would no longer be safe. Holding paint makers liable on nuisance grounds today because of the increased assessment of risk amounts to punishing them for activity that was considered safe at its time.

⁴² On the industry's knowledge, see Rabin, *supra* note 40 (At different times and circumstances the lead paint industry has stated that it eliminated lead from consumer paints by 1940, during the 1940s and 1950s, and by 1955. In 1970, in testimony to Congress on legislation to ban residential lead paint, the General Counsel to the National Paint, Varnish and Lacquer Association declared that the paint industry had halted the sale of lead paint for interior use over 30 years previously...)

Recently, in response to actual and threatened lawsuits against the lead pigment industry, brought by both lead-poisoned children and states and cities, the lead industry has claimed that it phased out lead paint in the 1940s and 1950s when it learned of the dangers of lead paint to children.

However, since lead paint's hazards were well-established by the 1920s, demonstrating that they ceased lead paint production in 1945 instead of 1955 would not appreciably reduce the industry's culpability. But the point is moot, since several federal government housing surveys conducted since the mid-1970s have conclusively shown that lead paint was applied to houses even past 1970.)

average strictly liable today on the ground that the 1950 average bioavailability level is now considered unacceptably dangerous.

Nuisance doctrine sometimes holds actors liable even though they began their offensive activity at a time when there were no neighbors to complain of the interference. For example, a smoke-belching factory might become a nuisance one day, because a residential area grows up around it, when it was not a nuisance at its beginning. One could try to extend this reasoning to argue that lead paint manufacturers should be found liable for a nuisance even for the period in which the harmful effects were not evident to them. But this argument is based on a misinterpretation of nuisance doctrine's function. Nuisance doctrine may hold an actor liable even though his activity was not a nuisance at its inception, but it still must be the case that the actor was aware of the invasive externalities of its activity. A smoke-belching factory may not be a nuisance at its inception because no neighbors are in its community, but even at that starting date it is fair to assume that the factory owners are aware of the invasive character of its emissions. If lead paint manufacturers were not aware of the risks for a portion of its time on the market, there would be little point on incentive grounds in holding them liable for injuries arising over that portion of time.

Thus, in addition to the problem of determining a method of identification among potential defendants (some of whom no longer exist), the lead paint cases involve the difficulty of identifying proper defendants within the time period of intentional conduct. Both of these are substantial hurdles in the way of applying nuisance law to the lead paint abatement problem.

It is difficult to say as a matter of theory that the lead paint cases could never satisfy the requirements of nuisance doctrine. Perhaps plaintiffs can fashion a case that meets the requirements suggested by the theory. The existing cases are far from the mark.⁴³

Even if all of the lead paint manufacturers were fully aware of the risks for the entire period of its marketing, and all of the responsible manufacturers could be identified and brought into court, the nuisance determination remains somewhat more difficult in the lead paint cases than in the standard nuisance. Presumably, there were few if any paint products that were entirely safe for consumption by children during the period in which lead paint was marketed. If the lead paint manufacturers faced a choice of using leaded paint or some other type (e.g., solvent-based paint), the tradeoff may have been between a paint that chips less frequently, with more harmful consequences from each flake, and one that chips more frequently, with less harmful consequences from each flake. Over the long term, the early alternatives to lead-based paint may have generated equivalent risks. If the real choice facing society was between banning the use of paint entirely, or using paint with some risks, then the nuisance determination is no longer as clear as it may seem to some observers today.

⁴³ Consider *State v. Lead Indus. Ass'n*, 2007 R.I. Super. LEXIS 32 (Feb. 26, 2007). The court eliminated the requirement of intent, see *id.*, at *26. The causation test adopted by the court does not attempt to determine relative risk allocations within the pool of victims, see *id.*, at *18-43.

B. Guns

Injuries from gun use in urban areas have provoked another recent attempt to use public nuisance doctrine as a tool for solving a public health issue.⁴⁴ Most of the public nuisance lawsuits against gun manufacturers have been dismissed since Congress passed a statute banning tort suits against gun manufacturers in 2005, but some of them remain alive as exceptions are read into the immunity statute. In spite of the decline in litigation, it is worthwhile to consider the implications of this paper's model for such claims, largely to compare with its implications for the lead paint lawsuits.

In what sense could the sale of guns be analogized to a public nuisance? Suppose an actor stored large quantities of explosives in a residential area, and thieves broke into the storage room and set the explosives off, destroying nearby residences. This would be a straightforward case for applying the *Rylands*-based doctrine of strict liability for extra-hazardous activities. And since *Rylands* and nuisance doctrine have the same legal roots, a nuisance action would be applicable as an alternative.

The argument from the perspective of plaintiffs is that the gun distribution networks are similar to explosive stores. Accordingly, some guns are so destructive that they should be viewed as the equivalent of explosives. Bringing them into a community is equivalent to introducing an extraordinary risk. An alternative theory for plaintiffs is that gun distributors knowingly permit their products to fall into the hands of criminal gangs. As nuisance theories, these arguments are not implausible.

The analogy with explosives also sheds light on the limits of the public nuisance theories used against gun sellers. One is the proximate cause issue; another is the cost-benefit balancing test.

Proximate causation presents an obstacle to the application of nuisance doctrine to gun injuries. Proximate cause is a wide ranging category of doctrines generally linked to the notion of foreseeability. One traditional interpretation of foreseeability is that it requires an unbroken sequence of probabilistically connected events from the defendant's tort to the victim's injury. The intervening conduct of a third party has sometimes been treated as sufficient to break the chain or sequence of probabilistic connection.⁴⁵

In terms of the model presented here, the proximate cause requirement serves to limit the scope of strict nuisance liability. The scope is limited to injuries that are obviously implied by the specific risk created by the offending activity. As I noted earlier, the proximate cause rule prevents strict liability from over-internalizing external costs. Return, for example, to the malarial pond as a nuisance. Strict liability is limited to the specific risk externalized, costs related to the spread and fear of malaria, and does not

⁴⁴ For a thorough review, see David Kairys, *The Cities Take the Initiative: Public Nuisance Lawsuits Against Handgun Manufacturers*, in *Guns, Crime, and Punishment in America* (Bernard E. Harcourt, ed. New York University Press, 2003).

⁴⁵ See, e.g., PROSSER, *supra* note 1, at 282-283.

apply to any accident whatsoever involving the pond. The function of the proximate cause limitation in strict nuisance liability is to induce optimal activity level choices.

Third-party intervention has received a special treatment in the law of strict liability. In general, third-party intervention has not served as a sufficient reason for limiting liability in the strict liability cases.⁴⁶ One exception recognized in *Rylands* is where the plaintiff himself is responsible for the escape of the dangerous element. The doctrine suggests that unless the plaintiff is the party responsible for the escape, and the plaintiff has acted recklessly or with intent, there is no limitation on liability based on the intervention of a third party in the strict liability context.

The treatment of third party intervention in strict liability doctrine is justifiable in light of this paper's model. If the point is to internalize the risks externalized by the defendant's activity, it would make sense to hold the defendant liable even when a third party intentionally causes the risk to be realized. The reason is that the risk of third party intervention that releases the risk to the community is, in most cases, a foreseeable component of introducing an extraordinary risk.

In spite of all this, the gun cases are distinguishable from explosives cases. In the explosives cases, the potential to destroy is sitting on the defendant's property waiting to be released in one step. The release could occur from an accident, from the reckless act of a third party, or from a bolt of lightning. The risk of a release may be small, but once it occurs, the damage is great. In contrast, in the gun cases distributors do not introduce an object that risks explosive force against the community. Guns by themselves are no more dangerous than knives by themselves. The guns pose no risk at all unless they are loaded; and even when loaded they become widely distributed, relatively small (in comparison to a bomb), and uncorrelated sources of risk. The degree of risk connected to each gun is dependent on the type of individual who holds the gun.

It would be entirely consistent with this paper's model to hold a group of actors strictly liable for harms that result from engaging in gun play within a city. The activity itself throws off an extraordinary risk. But the act of selling guns by itself does not throw off that kind of risk.

One could find an exception to this position. If a gun dealer knowingly distributes guns directly to a criminal gang involved in urban gun warfare, that should satisfy the proximate cause requirement for strict nuisance liability. On the other extreme is the ordinary gun distributor. Somewhere between these two extremes a line should be drawn on the use of nuisance doctrine.

The other major obstacle to the application of nuisance doctrine to gun distribution is external cost versus external benefit balancing test. The external risks thrown off by gun distribution are clear to anyone who has lived in an urban area with relatively high crime.

⁴⁶ See, e.g., *Yukon Equipment v. Fireman's Fund Insurance Co.*, 585 P.2d 1206 (Alaska 1978) (thieves cause explosion of storage magazine).

However, there are external benefits from gun distribution. Guns are used by law-abiding city residents to thwart crime.

In the neighborhoods in which crime is a big problem in most cities, many ordinary law-abiding residents have guns. This fact is a deterrent to a great deal of criminal activity. Many burglaries that are not occurring now presumably would occur if the criminals could be sure that the homeowners did not have guns. This is an external benefit that results from the ownership of guns by law-abiding city residents. It is clearly an externality, because not every law-abiding resident has to have a gun for the deterrent effect to be generally felt among the population of criminals.

I am aware of no empirical study that attempts directly to compare the external costs and external benefits of gun ownership. However, much of the public nuisance discussion proceeds as if there are no external benefits, or as if an activity can be declared a nuisance merely because it creates substantial external costs. There are substantial external benefits in the case of gun ownership. The external benefits may or may not exceed the external costs. But any assessment of gun distribution as a public nuisance should consider the external benefits.

VI. Conclusion

Nuisance law has seemed confusing to many commentators, and public nuisance law an especially confusing part of it. I have offered a model to make sense of it. Nuisance doctrine is complicated and covers a wide array of cases, but at its core it is simple and straightforward. Public nuisance law is closely related in a functional sense to private nuisance law. Both parts of the law are designed to engineer optimal activity levels, by imposing strict liability when externalized risks are far in excess of externalized benefits or far in excess of background risks. Existing nuisance doctrine is consistent with this model. The new public nuisance enforcement actions – for lead paint exposure and for gun-related injuries, and other modern public health issues – can claim to have a basis in nuisance theory, but have failed so far to be framed in a form that is entirely consistent with nuisance doctrine or theory.